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POLYCHLORINATED BIPHENYLS (PCBS) AND POLYBROMINATED DIPHENYL ETHERS (PBDES) IN CURRENT AND HISTORICAL SAMPLES OF AVIAN EGGS FROM NESTING SITES IN BUZZARDS BAY, MA, USA. Saro Jayaraman¹ (jayaraman.saro@epa.gov), M. Cantwell¹, C. S. Mostello², I.C.T. Nisbet³, and D.E.Nacci¹: (1) U.S.EPA, Office of Research and Development, Narragansett, RI; (2) Massachusetts Division of Fisheries & Wildlife Westborough, MA; (3) I.C.T. Nisbet and Company, North Falmouth, MA.

We measured concentrations of polychlorinated biphenyls (PCBs) and polybrominated diphenyl ethers (PBDEs) in eggs from breeding colonies in Buzzards Bay, MA, USA. Eggs from two piscivorous bird species, common (*Sterna hirundo*) and roseate (*Sterna dougallii*) terns, were collected in the spring of 1972, 1994 - 96, 1998 - 99 and 2005. Prior to analyses, we predicted temporal declines in tern egg PCBs in association with declines since the 1970s in sediment PCBs from a nearby Superfund site, New Bedford, MA. However, we expected a temporal increase in PBDE concentrations in tern eggs, reflecting local and globally-transported industrial contamination from these compounds primarily used in recent years as flame retardants. As predicted, PCB concentrations have declined since 1972 in eggs from both tern species. For example, total PCB concentrations, reported as the sum of eighteen selected PCB congeners, averaged 157,322 ng/g lipid for 1972 samples and 34,602 ng/g lipid for 2005 samples of common tern eggs. PCB congener patterns in tern eggs have also changed. The predominant congeners found in tern eggs collected in recent years included PCBs 118, 153 and 138, which contributed to 66-70% of total PCBs; whereas lower chlorinated PCBs predominated the PCB patterns from earlier years (1972). PBDEs were measured in extracts from these same egg samples using a novel negative ion mass spectrometer method (described elsewhere) and reported for eight selected congeners. As expected and in contrast to the decline observed for PCBs, total PBDE concentrations increased from detection limit (< 3 ng/g) in 1972 samples to an average of 1,086 ng/g lipid for 2005 common tern egg samples. Results from these analyses were also compared to PCB and PBDE concentrations measured for recently collected (2003) eggs of tree swallows (*Tachycineta bicolor*), insectivorous birds drawn to nesting boxes located in the Superfund site. Statistical analyses are underway to evaluate contaminant-specific interspecies variations, assess the influence of the Superfund site on PCB contamination, and characterize the potential for adverse effects from these toxic contaminants in avian eggs.

Keywords: terns; tree swallows; PCBs; PBDEs;

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